National Institute of Environmental Health Sciences

# Transgenic crops coping with water scarcity

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**Abstract:**

Water scarcity is a serious problem that will be exacerbated by global climate change. Massive quantities of water are used in agriculture, and abiotic stresses, especially drought and increased salinity, are primary causes of crop loss worldwide. Various approaches may be adopted to consume less water in agriculture, one of them being the development of plants that use less water yet maintain high yields in conditions of water scarcity. In recent years several molecular networks concerned with stress perception, signal transduction and stress responses in plants have been elucidated. Consequently, engineering some of the genes involved in these mechanisms promises to enhance plant tolerance to stresses and in particular increase their water use efficiency. Here we review the various approaches used so far to produce transgenic plants having improved tolerance to abiotic stresses, and discuss criteria for choosing which genes to work on (functional and regulatory genes) and which gene expression promoters (constitutive, inducible, and cell-specific) have been used to obtain successful results.

**Source:** http://dx.doi.org/10.1016/j.nbt.2010.08.005

## Resource Description

**Exposure :** ☑

weather or climate related pathway by which climate change affects health

Food/Water Security, Food/Water Security

**Food/Water Security:** Agricultural Productivity

**Geographic Feature:** ☑

resource focuses on specific type of geography

None or Unspecified

**Geographic Location:** ☑

resource focuses on specific location

Global or Unspecified

**Health Co-Benefit/Co–Harm (Adaption/Mitigation):** ☑

specification of beneficial or harmful impacts to health resulting from efforts to reduce or cope with greenhouse gases

A focus of content

**Health Impact:** ☑

specification of health effect or disease related to climate change exposure

Health Outcome Unspecified

**Intervention:** ☑

strategy to prepare for or reduce the impact of climate change on health

A focus of content

**Mitigation/Adaptation:** ☑

mitigation or adaptation strategy is a focus of resource

Adaptation

**Resource Type:** ☑

format or standard characteristic of resource

Review

**Resilience:** ☑

capacity of an individual, community, or institution to dynamically and effectively respond or adapt to shifting climate impact circumstances while continuing to function

A focus of content

**Timescale:** ☑

time period studied

Time Scale Unspecified